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Indian Agriculture and Rural Development

Strategic Issues and Reform Options

A Strategy Paper Prepared by IFPRI's Senior Management Team for Consideration by the Policymakers of the Government of India

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Recommended Actions

- Promote pro-poor rural and agricultural development by increasing investments in rural infrastructure and agricultural research and development (R&D).
- Reorient social safety nets to create more employment in rural areas; help strengthen the human resource base through education, nutrition, and empowerment of women; and build physical infrastructure.
- Reform water management and institutions and design water pricing systems on the basis of water rights to cope with increasingly scarce water supplies for agriculture.
- Exploit new opportunities to participate in the production and marketing of high-value livestock products, fruits and vegetables, and fishery.
- Work toward establishing and strengthening a rules-based multilateral trading system through World Trade Organization (WTO) negotiations and explore second-best options for bilateral or regional free trade agreements with other major developing countries.

The Paradox and Challenges of Indian Agriculture

Indian agriculture is facing a policy paradox. Although several forecasts of the 1990s predicted that India would be a large importer of grains in the years to follow, in fact from 2001 to 2004 India exported around 30 million tons of foodgrains. It was seeking primarily to liquidate its bulging grain stocks, which reached 63 million tons in July 2002. Whereas India's agricultural policy is still rooted in the goal of self-sufficiency in grains, consumption patterns are changing fast toward high-value agricultural products such as fruits and vegetables, livestock products, and fish. The policy environment is lagging behind the structural change occurring in India's consumption and production baskets. On another front, foreign exchange reserves, which had reached a rock-bottom US$1.2 billion in July 1991, climbed to more than US$120 billion by the end of 2004.

Nonetheless, despite comfortable food and foreign exchange reserves and reasonably high growth in gross domestic product (GDP) of about 6 percent annually, India still has more than 250 million underfed people (below the poverty line) and high under-

employment. This situation reflects severe problems on the distribution front.

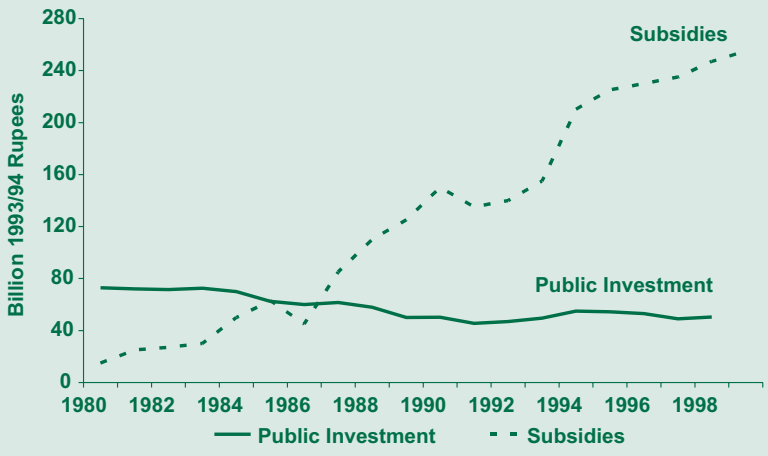
What are the reasons behind this paradoxical situation? The answer presumably lies in the neglect of, as well as misallocation of resources in, agriculture and rural development, especially in the later phase of the reform process initiated in 1991. The average annual rate of growth in agriculture fell from more than 4 percent per year during 1992/93 to 1996/97 to less than 2 percent per year during the period 1997/98 to 2002/03, and it remains low. What led to this dramatic decline in the growth of agriculture since 1997/98? How can it be revived? How can growth in agriculture and rural development diminish poverty quickly?

To stimulate pro-poor agricultural growth and rural development, India will need to make some strategic choices. We propose action in five major areas that can help the government to accelerate agricultural growth and reduce poverty, malnutrition, and unemployment quickly and on a sustainable basis. All of these reforms can be achieved with due regard for the well-being of the country's rural poor.

1. Enhancing Pro-Poor Rural and Agricultural Investments and Cutting Subsidies

Since the early 1980s public investment in agriculture has experienced a secular decline, while input subsidies (on fertilizers, power, and canal irrigation) have been rising. In the early years of economic reforms, an attempt was made to arrest and reverse these trends (see Figure 1), but this effort could not be sustained. As a result the gap between investments and subsidies kept widening. Today input subsidies, together with food subsidies, amount to roughly five to six times the public investment in agriculture. With a burgeoning subsidy bill and shrinking public investment, the growth impetus for agriculture has been declining. Private investment in agriculture has been increasing, yet it has not fully compensated for the loss from falling public investment.

Figure 1 Public investments and input subsidies in Indian agriculture



Source: Ashok Gulati and Sudha Narayanan, *The Subsidy Syndrome in Indian Agriculture* (New Delhi: Oxford University Press, 2003).

The first strategic decision must be to raise the level of public investment in agriculture and in rural India. This move would also help unleash private sector investment, which complements public investment. The strategy should be to contain and target subsidies and plow the savings back into agriculture as investment.

IFPRI research shows that investments in R&D have the highest impact on agricultural growth per million rupees invested. The rates of return to public investment in research have been as high as over 60 percent, and in extension, over 50 percent. India currently invests only about 0.5 percent of its agricultural GDP in agricultural research, compared with 0.7 percent in the developing countries as a whole and as much as 2–3 percent in the developed countries. These figures suggest that government has been systematically underinvesting in a sector that offers a high social return and that there is considerable scope for diverting incremental outlays to priority areas in research.

Investment in rural roads has the most potent effect on poverty alleviation, per million rupees invested, followed by investment in R&D. Across regions, the returns on each million rupees invested in the less-favored (rainfed) areas of western and southern India are now higher than in the irrigated tracts of the northwest. These rainfed areas were largely bypassed by the Green Revolution. Thus any investment in this region has a win-win potential in terms of both higher returns (efficiency) and equity.

In R&D, India had a successful record of importing high-yielding seed varieties and adapting them to local conditions during the late 1960s and 1970s, an effort that led to the Green Revolution. Although there is still ample scope for increasing rice and wheat yields, especially in the water-abundant eastern belt, the Green Revolution has been stagnating in the northwest states of Punjab, Haryana, and western Uttar Pradesh, as well as in the southern states of Andhra Pradesh and Tamil Nadu. To keep pushing the production frontier outward, India must invest in new technologies and the institutions to accompany these technologies.

The new agricultural technologies on the horizon are largely biotechnologies. Indian policymakers, scientists, and regulators have long supported the development of biotechnology (including genetic modification) that provides new crops favorable to India's climatic areas and is suitable for use by farmers in rural communities. One of the most important technologies in the Indian context is one that produces drought resistance. Developing biotechnology appropriately, however, will require effective research and reforms of the regulatory structure and process, duly recognizing the local and international debate on biotechnology, particularly regarding genetically modified (GM) crops. In this context, setting up a body like the National Biotechnology Regulatory Authority (NBRA) would enhance regulation of biotechnology in India.

Investments in advanced crop technologies for Indian farmers will pay off only if there are accompanying investments in infrastructure. The connection of India's villages to information and communications technology is an important component of these initiatives. The private sector can be the key driving force, and many corporate giants have already entered rural areas with a view to

expanding business. But public policy should facilitate these investments in rural areas by removing controls on private investment as well as by offering tax concessions for investing in rural areas, in order to improve poor communities' access to education, market information for farmers and other small businesses, and service information.

Investing in appropriate institutions is as important as investing in agricultural R&D and infrastructure. Institutional changes are required to ensure greater transparency and accountability in implementing agencies. India faces endemic problems stemming from poor staff incentives and a lack of financial autonomy, accountability, and transparency in its public sector agencies. The best solution is likely to be selective privatization that takes into account both equity and efficiency considerations. Public investment needs to be made more pro-poor and productive through decentralization. Community participation in constructing and maintaining rural infrastructure is crucial for the efficient operation of financial incentives and the establishment of a legal framework. The typical top-down approach followed so far in public investments will not give the desired results. Heavy participation of user groups and nongovernmental organizations (NGOs) in maintaining public infrastructure is required to turn the process of rural development from top down to bottom up.

2. Reforms with a Human Face: Addressing the Landless Poor

Reforms in the agricultural sector are an important step toward increasing growth rates in the Indian economy and thus reducing poverty sustainably. But many households are not in a position to share in economic growth because of their low asset base (for example, poor nutrition, low education, and few physical assets). Studies reveal that there is typically little mobility out of extreme poverty, and many households remain poor for generations. Indeed, low human capital status and an inability to build up a minimum physical asset base play a key role in the intergenerational transmission of poverty. Any credible, broad-based development strategy must therefore involve public policies aimed directly at promoting asset accumulation by chronically poor households.

In addition, the labor productivity of the poor is currently impaired by nutrition problems, including "hidden hunger" in the form of micronutrient deficiencies. Agricultural research and production programs should focus on addressing these deficiencies through supplementation, fortification of foods (including complementary foods), and attention to making low-cost foods that are rich in micronutrients.

India is home to a wide range of social safety net programs that together attempt to address the needs of poor households at various stages of the life cycle. For households with young children, the Integrated Child Development Scheme (ICDS) provides take-home food rations linked to acquiring nutrition guidance and crucial health care. To promote higher educational attainment, the Mid-Day Meals Program provides meals to children attending school. The Public Distribution System (PDS) provides subsidized food rations to poor households through a vast network of fair-price shops. A range of community public works programs (such as Jawahar Gram Samridhi Yojana or Employment Guarantee Schemes [EGSs]) provide employment to the poor during periods of economic downturn or during the slack agricultural season. The National Old-Age Pension program and the Annapurna program provide cash to destitute elderly households without alternative family support. These programs should be transformed from social assistance to social development programs that contribute directly to the creation of physical and social assets.

Although safety net programs in India vary widely and absorb substantial public funds, their combined effectiveness is questionable. Rationed food subsidies are often poorly targeted, and corruption prevents much of the food from reaching the intended beneficiaries. For example, 53 percent of India's rural poor live in three states (Bihar, Uttar Pradesh, and Madhya Pradesh), but their dependence on subsidized food through the PDS off-take is only between 5 and 10 percent of their total cereal consumption—too little to make much difference in their food security. The costs associated with public distribution of food are also often unnecessarily high.

There is a need to rationalize wages in public works programs, walking the line between too-high wages, which will result in leakage of transfers to nonpoor households, and too-low wages, which will undermine the very objective of the programs—that is, poverty alleviation. These two considerations need to be balanced, in line with minimum wage regulation. In addition, high costs associated with managing the creation of assets through public works programs absorb scarce resources, and the resulting projects are often of low quality or never benefit the poor. The economic inefficiencies associated with financing these safety net and public works programs can also be substantial, as is the case with foodgrain support prices that distort production incentives. These different safety net programs are often poorly integrated, with some households receiving benefits from a number of sources and other poor households being completely excluded.

As a first step, existing social safety net programs in India need to be revisited to assess their targeting mechanisms, coverage, cost-effectiveness, and overall impact on poverty alleviation. Research at IFPRI, along with several studies in India, shows that programs like the EGS of Maharashtra to build rural infrastructure are more cost-effective in reaching the poor than is the untargeted PDS. These public works schemes need to be scaled up to build rural infrastructure, develop and preserve watersheds, undertake forestation, desilt canals, and so forth.

Bangladesh's Food for Education (FFE) scheme and India's own ICDS show that targeted programs have been highly successful and are worth investigating. Under the FFE scheme, the poor family of the school-aged child gets a quantity of subsidized food as long as the child attends school. This program ensures higher attendance in village schools, especially of girls, and provides food security to the poor. Such a program may be worth implementing in India on a pilot basis.

Achieving reforms for the landless poor requires developing and applying credible evaluation techniques that can then inform the design and implementation of programs. Given budget constraints and the extent of poverty in India, the country cannot afford to tackle the problem of assisting the landless poor without substantial improvements in the cost-effectiveness of the overall social safety net system. Fortunately, we have learned much from diverse experiences in several developing countries, and the wide variation in program performance across Indian states may also be a valuable source of lessons for future policy reforms.

3. Addressing the Water Challenge

Rapid growth in nonagricultural water demand, the unsustainable overdraft of groundwater, and a slowdown in the growth of water supply investments are leading to growing water shortages for agriculture in much of India. These shortages are likely to worsen in the coming years if business as usual continues, and the local impacts on agricultural employment and rural livelihoods could be severe. Concerted policy efforts, however, could significantly mitigate the negative effects of growing water shortages.

The ultimate irrigation potential of the country is roughly 140 million hectares, of which not more than 70 percent has been exploited. During the Ninth Five-Year Plan (1997–2002), irrigation grew at only about half of its target rate. Large investments would be required to complete several hundred irrigation schemes that have gone unfinished for years because of severe resource constraints. Additional resources for those projects nearing completion would bring high returns to investments already made.

Part of the solution to water scarcity, however, lies outside of the irrigation sector. Increased investments in agricultural research could boost agricultural productivity to compensate for the diversion of water from agriculture to domestic and industrial uses. Crop research needs to target rainfed production as well as irrigated areas, taking pressure off the irrigated crops sector. In the domestic and industrial water sectors, improving both efficiency and equity through increased water prices would provide incentives for conservation, cover the costs of delivery, and generate adequate revenues to finance the needed growth in supplies and expanded coverage of clean piped water. At the same time, pressure on water transfers from agriculture would be reduced. Generalized domestic and industrial water subsidies need to be replaced with subsidies targeted to the poor.

In the irrigation sector, water policy should be designed to induce investment in improved technology and conservation of water and to encourage diversification away from irrigated cereals into crops that give more value per unit of water. It is feasible to design and implement water pricing systems on the basis of water rights that would introduce positive incentives for efficient water use and crop diversification, recover operations and maintenance (O&M) costs, and protect and even increase farm incomes.

Water rights, combined with appropriate incentives, are essential for establishing rational water allocation because they provide users with the security to invest in water-saving technology and practices. Because of the large number of small farmers in Indian irrigation systems, in most cases it is preferable to assign water rights to water user associations rather than to individual farmers. A water brokerage system with a river basin authority, or an irrigation system that brokers water trades among irrigators and between irrigation and nonirrigation water uses, could establish incentives to use water efficiently without reducing farm incomes. A base water right would be established at major turnouts to water user associations. The user group would be responsible for internal water allocation. A fixed base charge would be applied to the initial (historical) quantity, sufficient to cover O&M and longer-term asset replacement (depreciation) costs. For demand above the base water right, a price equal to the value of water in alternative uses would be charged to users; for demand below the base right, the same price would be paid to the water user for not using the water. This system would facilitate the mutually agreed purchase and transfer of water to higher-valued uses. The promise of efficient water use and the allocation of water resources without harming the welfare of irrigators and other rural water users make the establishment of water rights, together with appropriate incentives, one of the highest priorities for water reform.

4. Toward High-Value Agriculture

Given sustained increases in per capita incomes of about 4 percent per year during the past two decades, consumption patterns in India are changing away from cereals to high-value agricultural products. How fast has the consumption basket of an average Indian changed? Data from the National Sample Survey Organisation (NSSO) show that per capita consumption of cereals from 1977 to 1999, for example, declined from 192 to 152 kilograms per year in rural areas and from 147 to 125 kilograms in urban areas. The consumption of fruits, on the other hand, increased by 553 percent, of vegetables by 167 percent, of milk and milk products by 105 percent, and of meat, eggs, and fish by 85 percent in rural areas over the same period. Similar changes occurred in urban diets. These dramatic changes indicate a structural shift in Indian diets. Add to this the new export market opportunities for many of the same products, owing to trade liberalization, and there is a happy match between the demands of the market and the need for farmers to diversify into higher-value activities. Further, high-value agricultural products have higher employment elasticity and can be suitable for smallholders, if they can participate.

In this new situation, more of the energies and resources of the agricultural sector can be unleashed to produce the kinds of high-value foods and products that are now in high demand by India's growing middle classes and urban dwellers and that have new export market opportunities. A reinvigorated agricultural and agribusiness sector could thus continue to be a major engine of income and employment growth for the country. Despite the tremendous opportunities ahead, success is not yet assured. Important challenges will need to be overcome.

The first challenge is to further shift the government's priorities from heavy support and protection of food staples to promotion of agricultural diversification, processing, and commercialization. Simply put, most farmers are not going to get rich by growing cereals when there are already national surpluses, demand growth is slow, and world markets are glutted with the subsidized production of rich-country farmers. Farmers must shift into higher-value products to increase their incomes.

A set of public policies and investments is required to fully unleash this new potential. This set must include additional public investment in the kinds of rural infrastructure and technologies needed for these new high-value activities, improvements in marketing and distribution systems for higher-value and more perishable foods, and further liberalization of the agroindustrial sector. The private business sector can and should play a dominant role in these higher-value market chains, and public policy must strengthen the enabling environment. This change will require a fundamental shift in thinking in many public agencies that are still geared toward the dominant role that the state played in the market chains for food staples during the Green Revolution era.

Although some of the funding for these new investments will come from the private sector, new public investments are also needed. The needed funds might be obtained by reducing some of

the huge subsidies that are still maintained on fertilizers, credit, and water for the food staples sector and that no longer serve a useful purpose. This could be a win-win strategy for farmers and the government and at the same time could contribute to national economic growth.

The second challenge for the "new" high-value agriculture is to make it pro-poor. Left to market forces alone, the major beneficiaries of the new high-value agriculture will be mostly the larger and commercially oriented farms, as well as farms that are well connected to roads and markets. The majority of the 300 million or so poor people in India are rural people who depend on agriculture for their living, and many live in the less-favored regions. These people must not get left further behind during the next phase of India's agricultural development.

Fortunately, there is great opportunity to guide the new high-value agriculture so that small farms and even many less-favored regions can be major participants. Achieving broad participation will require improving infrastructure and education in many less-favored regions and communities, ensuring that small farms get the technologies and key inputs they need, and promoting producer marketing organizations that can link small farmers to the new market chains (supermarkets, contractors, processors, exporters, and the like). Small farmers cannot do all of these things on their own, and the public sector, private sector, and NGOs all have important roles to play. Because high-value agriculture demands more working capital, which small farmers often lack, a major effort must be made to reform the rural credit delivery system to reach smallholders. Innovative institutions promoting vertical coordination between farms, firms, and forks (supermarkets) would reduce transaction costs and market risks and would also act as a conduit to funnel more credit into this venture, especially for smallholders. This system would help lay a foundation for globally competitive agriculture in which smallholders can also participate and prosper. Public policy can make a major contribution by facilitating farmer organizations, standardization, transparent food safety policies, and contract security between farmers and the processing and retail industry.

A third challenge will be overcoming many of the environmental problems that now plague agriculture. Water scarcities will continue to grow, and farmers must learn to use less water and to be less polluting. Land degradation and deforestation must also be contained. A shift toward more diversified and higher-value farming systems will help, both because many of the new crops need less water and because, by increasing returns to land, small farmers will have less need to overexploit poor lands and soils.

Although agriculture can make a significant contribution to growth, employment creation, and poverty reduction, on its own it will not drive the full economic transformation that is now possible for India. A fourth challenge, therefore, is for policymakers to find ways of accelerating growth in the service and manufacturing sectors, which will require continued economic liberalization and privatization.

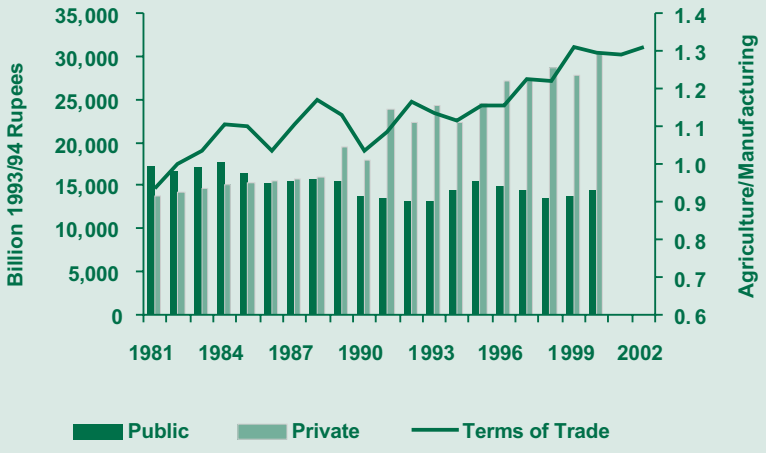
5. Trade and Market Policy Reforms

The policy reforms of the 1990s more or less eliminated the bias against agriculture by lowering industrial tariffs and liberalizing exports of agricultural commodities. This change improved the relative incentives environment (measured as the ratio of agricultural prices to prices of manufactured goods) in favor of agriculture, providing a strong boost to private sector investments in agriculture (see Figure 2).

The liberalization of agricultural exports also led to a major upswing in agricultural exports, at least from 1992/93 to 1996/97. But the years 1997/98 through 2002/03 did not augur well for agricultural exports. The world prices of most agricultural commodities fell sharply, primarily triggered by the East Asian crisis. This decline highlighted the difficulties in integrating domestic agricultural markets with world markets. Whereas developed countries such as the United States and the European Union countries resorted to subsidizing their farmers, developing-country policymakers did not have many options and accepted the loss of those markets.

This outcome raises the fundamental issue of establishing and strengthening a rule-based system in the global trade of agricultural commodities. In an increasingly interdependent world, it is neither desirable nor feasible to remain insulated from global markets. India, as a major player in the developing world, should play its due role in WTO negotiations and push for multilateral global liberalization of agricultural trade. Although India should insist on substantial cuts in the export subsidies and domestic support being provided to agriculture in the Organisation for Economic Co-operation and Development (OECD) countries, it should also be ready to open up its own markets step by step. Major trade increases are going to take place within the developing world over the next two decades or so, and therefore it would be in India's interest to form a strong coalition of developing countries to open markets while pressing for reducing distortions in developed-country agricultural policies. India's role in the G20

Figure 2 Agricultural terms of trade and GFCF in India



Source: Economic Survey, GOI; Ministry of Agriculture, GOI.
Note: GFCF = Gross fixed capital formation in and for agriculture.

coalition at Cancun proved strong in putting pressure on the OECD countries, but India and its coalition partners Brazil, China, South Africa, and others must engage further to break the deadlock and argue for rules-based open trade. In the event of a slowdown in multilateral negotiations, given the complexities, India should open a second track of negotiations on bilateral and regional free trade agreements with major developing countries in the region (like China) and beyond (like Brazil and South Africa).

India can harvest rich returns from trade liberalization, provided it also carries out large-scale reforms to streamline domestic markets and put in place the infrastructure and institutions to connect local markets with national and global markets. These reforms would involve removing all controls on the functioning of domestic markets, such as movement restrictions, stocking limits on private trade, levies on rice and sugar mills, controls on investments in large-scale agroprocessing and on foreign investments in retail chains, and bans on direct buying from farmers by processors. India should also introduce new institutions such as futures trading that can reduce market risk and promote investments. Further, to integrate the domestic markets with world markets smoothly and manage trade liberalization more effectively, India needs institutions that can closely monitor movements in world and domestic prices and take timely and appropriate actions to avoid major shocks. Here, an institution like an agriculture tariff commission may be more useful than the existing Commission for Agricultural Costs and Prices.

Summary

In summary, we suggest five areas for action to put rural India on a higher growth trajectory that would cut hunger, malnutrition, and unemployment at a much faster pace than has been the case so far. The five areas for action are interlinked and would best work if pursued in conjunction. We emphasize investments with a human face that include and reach out to the rural poor and a reorientation of subsidies toward such investments.

1. India should increase investments in rural infrastructure (including transport and information technology that connects villages) and agricultural R&D (leading to improved technologies for farmers). This is our most important suggestion. To ensure high returns on these investments, India will have to invest in institutions that make implementing agencies transparent and accountable to user groups. Part of this expansion of pro-poor investments in rural India should be financed by reducing food and input subsidies, making them available only to vulnerable groups.

2. India should reorient its social safety nets to create more employment in rural areas; help strengthen the human resource base through education, nutrition, and empowerment of women; and build physical infrastructure. In this context, schemes like the EGS of Maharashtra to build rural infrastructure and FFE, well tested in Bangladesh, are much more promising than the untargeted PDS. These social investments must also address the high prevalence of micronutrient deficiencies (especially of iron, vitamin A, and zinc) among the poor.

3. Water is going to be increasingly scarce. Investing large sums in new mega-irrigation schemes may not be the best course of action, but it is important to complete those in which a lot of money has already been invested. Overall, however, managing water use through institutional changes, such as water rights that are based on farmer groups and water-harvesting schemes in dry areas with local participation, are likely to be more rewarding. Price reforms in irrigation, and even power supplies for agriculture, can succeed only if accompanied by suitable institutional reforms.

4. Indian agriculture faces promising opportunities in the production and marketing of high-value livestock products, fruits and vegetables, and fishery. To exploit these opportunities, India must liberalize its marketing and trade policies to encourage vertical coordination between farms, firms, and forks (supermarkets); facilitate increased flow of rural credit, especially to smallholders, through, say, nonbanking financial intermediaries; and withdraw any special concessions in support of foodgrain policies.

5. Trade liberalization in agriculture has the potential to bring rich dividends to developing countries, including India. To realize this potential, India must work toward establishing and strengthening a rules-based multilateral trading system through WTO negotiations. In the event of major hurdles in WTO negotiations and a delay in reaching any substantive agreement, India should explore its second-best options of reaching bilateral or regional free trade agreements with major developing countries in the region and beyond. Furthermore, to exploit the full potential of trade liberalization, India should carry out "behind the border" reforms by streamlining its own domestic markets, institutions, and infrastructure.

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